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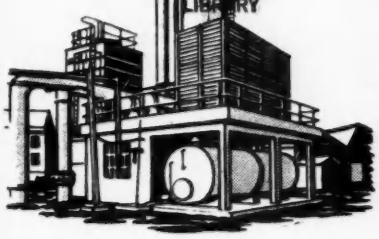

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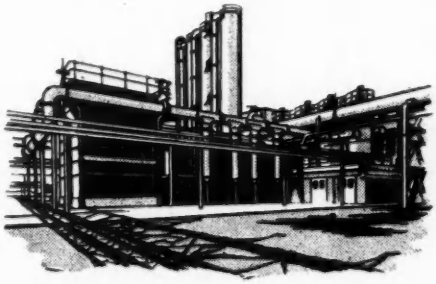

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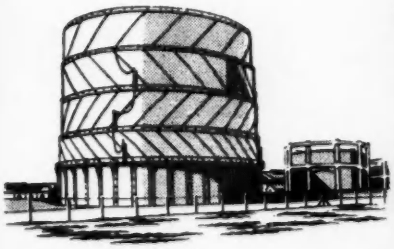

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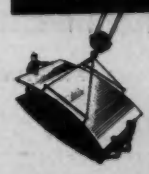

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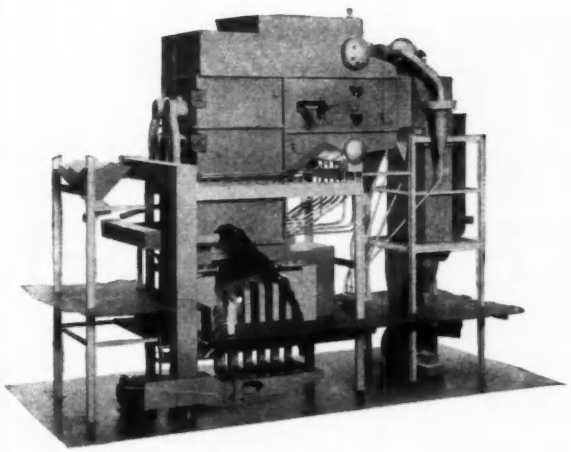

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Gas Journal

COKE OVENS • BY-PRODUCTS • CHEMICALS

The downward trend can be stopped

THE historical background to any situation is both interesting and instructive. It may also be helpful in assessing the best means of deciding on the policy to be followed in the immediate future. Many are disturbed by the stagnation of gas sales in the last few years and a great deal has been talked about reducing the costs of gas production by the use of new raw materials and new types of plant, but comparatively little about new outlets for gas to domestic consumers.

In Mr. G. M. Polanyi's paper, ' Gas and the domestic market ', which he read recently to the Manchester and District Section of the Institution, an abstract of which appears in this issue, is a review of the trends in domestic gas consumption from the pre-1920 period up to the present day.

Mr. Polanyi is the statistician to the North Western Gas Board. He looks at this particular problem as it has affected the great urban areas served by his Board. His paper is essentially the result of the careful digestion of a mass of statistics, drawn from a series of surveys on appliances already installed in property dating from various periods of construction.

Reading his description of property in working class districts constructed before 1920, one almost gains the impression of some kind of fossil from which it is possible to study the conditions of domestic gas appliances and their installation more than 40 years ago.

That this was possible in the early 1950's, when the particular survey was made, gives some impression of the state of the industry at the end of the war, before it became possible for an organised attack to be made on the vast amount of obsolete ' junk ' there must still have been in many working class households.

The replacement of old-fashioned black cookers by modern, efficient, well-designed equipment in cheerful colour schemes is the outward sign of the immense progress made by the industry generally and in this case the North Western Board in particular, to show that gas is a modern fuel.

The theme of Mr. Polanyi's paper may be taken as the development of the desire of the ordinary householder in whatever income group he may be, to increase his standard of comfort as his relative means improve. Refined fuels are then the key to the situation and their choice by the householder is an important factor in the prosperity of that particular fuel industry.

One thing is quite clear. Ever since the electric lamp began to compete with gas lighting—first the old batswing burner and then the Welsbach mantle—gas has had to make good its losses by entering the cooking and water heating fields, to the detriment of the consumption of raw coal.

In the ensuing battle between the refined fuels, gas, electricity and oil, the chief sufferer has in every case been coal. Any advantage gained by one refined fuel has had to be recouped by another encroaching even further on coal.

In the post war period this may, we think, have been accelerated by the lack of domestic help in addition to the more obvious one of coal rationing, making it plain that there were other means of space heating, which had distinct advantages over the open fire, however cheerful and homely it might be.

In the fight between the refined fuels for supremacy among themselves in the domestic market, electricity would appear to be winning. It has arisen from comparatively small beginnings in the early part of the century to the enviable position of being able to double its output every ten years. This is particularly frightening for its chief competitor in the overall fuel market, but we are of the opinion that thanks to the tremendous efforts being made by the sales personnel in the gas industry at all levels, the stagnation of the last few years is at last being broken.

Mr. Polanyi refers to the supplementary heating units, most of them portable, added to improve the overall comfort in an inadequately heated house, as ' bric-à-brac '. Although each unit in itself may be well-made and efficient, we feel that like the more familiar forms of bric-à-brac, this form too should by now be both out of fashion and out of place in the modern household.

Central heating is clearly the solution, either as background heating with individual gas-fired room heaters, or complete in itself without additions. It may take the form of small bore central heating or ducted heated air, but in either case it does away with bric-à-brac and encourages the use of a refined fuel. Gas can be used for the first type and must be used for the second.

Mr. Polanyi points out that the advantages of central heating are being appreciated by the smaller householders, who can now afford to enjoy them.

This perhaps, is more far-reaching than it may at first sight appear. Compared with electrical and oil-burning appliances, the cost of installing gas is much higher; added to this the intermittent use to which gas fires, for example, where restricted in the past, increased its commodity price. The realisation of the advantages to be gained from larger, fairly continuous loads and their translation into realistic two-part tariffs should, Mr. Polanyi thinks, keep gas competitive at least for the present with other refined fuels. He is convinced, however, that unless the industry frees itself from its dependence on coal, such equality can never be permanent.

He makes out, we think, a very good case for immediate steps to be taken for Great Britain to become part of the Western European gas grid—now being planned to enable natural gas to be transported from the Sahara and distributed among the industries of Europe. He is convinced that the flight from coal is going to continue, and that this very same trend in the house towards less drudgery and dirt, and a desire for more pleasant working conditions will drive up wages in the coal industry with its high labour content, and nullify the advantages gained from all the efforts of both the commercial and technical sides of our industry to compete and maintain the 'edge' on electricity.

Cheap natural gas—or at least oil-based manufactured gas—is the solution he advocates. Dependence on a foreign fuel supply is a risk which may well have been exaggerated, but, though sympathising with Mr. Polanyi's point of view, we feel that our coal industry is far too important to scrap practically overnight, as might well be the case if really cheap fuel became available to both the householder and industry.

Layman's guide to domestic heating

A MAJOR trend in modern living is towards increased home comfort. In the heating field this has resulted in a spate of new equipment and improved techniques, and an equally large volume of (sometimes contradictory) literature. A recently published book, 'Domestic Heating', edited by W. F. B. Shaw, B.A. (Temple Press Ltd., 21s.), sets out to assist the ordinary householder, and possibly some architects and builders as well, to a fuller appreciation of the space and water heating services currently available. The book contains a series of specialised essays on the various fuels concerned, and on system and appliance selection and connected topics.

The gas section is written by A. R. Bennett, M.SC., M.INST.F., M.I.GAS E., an author who presents a very clear and up-to-date exposition of the various gas services obtainable. The chapter includes comprehensive tables of the present types of appliance and their intended purposes, and descriptive paragraphs competently summarising gas advantages and methods of equipment installation, control, and usage. The advice given is basically sound, but it is perhaps inevitable that in view of the necessity of producing a highly compact article, and at the same time avoiding explanatory technicalities, a few sentences could perhaps be misunderstood by the lay reader. For instance, a paragraph dealing with the use of a gas circulator in combination with a solid-fuel boiler might be read as advocating the installation of stop-cocks in the boiler primary flow and return pipes, a practice that is not generally followed. Illustrations here are all good, clear, photographs, excellent for their purpose. An obvious error is the textual description of a pictured under-draining-board storage set as a sink storage water heater; a trifling mistake, but puzzling perhaps to the non-technical reader.

The chapters on solid fuel, oil, and electricity, offer equally authoritative and straightforward accounts of the domestic services available, and the information given might well be of value not only to the householder, but also to the gas sales representative who advises him.

Remaining sections of the book, several written by the editor, can be divided into two groups; those generally informative on such topics as insulation, ventilation, comfort and safety, and others comparative of installations and fuels. All these chapters reach the same high standard of condensed clarity and basic truth, but in a few instances only, less than the full gas story is told. In the first chapter, for example, mention of small-bore, forced-circulation central heating could leave the inquirer with the impression that such systems are solely solid-fuel fired, and later in the book it is stated that warm air central heating systems 'now on the market give a combined space heating and water heating service'. There are, of course, many gas-fired small-bore units, and warm air systems quite independent of water heating. It is also interesting to notice that 'cannot be stored on the premises' is quoted as a disadvantage of gas, although no mention is made of the consequent advantage of needing neither storage space nor ordering and delivery arrangements.

Fuel running costs are compared on the basis of cost per useful therm, that is, standard fuel prices are taken and adjusted to a thermal output price according to appliance efficiencies. The resulting figures are generally acceptable, although there is perhaps a good case for increasing the efficiency figure for a modern gas convection fire beyond the 60% given. In general, gas is depicted as cheaper than electricity, but dearer than solid fuel or oil.

It is of interest that of the seven heating appliances depicted on the dust cover of the volume, five are gas, and the other two might well be gas ignited. Inside, however, no undue favouritism is shown to any fuel, and in the main, and subject to the limitations noted, the book achieves its objective in being a basically fair guide for the intelligent layman.

From a paper read to the Manchester and District Section of the I.G.E.

Gas in the domestic market

By G. M. POLANYI, M.A.,
STATISTICIAN, NORTH WESTERN GAS BOARD

THE outstanding feature of the domestic fuel market in the first half of the twentieth century has been the switch from direct coal use to the use of the 'refined' fuels. And the major influence here has been the rise in national income and living standards, which has given the advantage to fuels and appliances offering high standards of comfort and labour saving.

The switch from coal has proceeded in a series of phases, of which the most recent has favoured electricity and oil rather than gas. There is evidence, however, for the view that the next stage, which is now beginning, will favour gas at least as much as the rival 'refined' fuels. It is a stage which offers, in fact, an opportunity for the industry that is comparable to the first development of gas lighting 150 years ago.

Between 1938 and 1958 national income in this country, at constant prices, increased by nearly 50%. Over the same period the direct use of coal in the domestic market dropped from 49 mill. to 36 mill. tons, or by about one quarter. At the same time, the use of refined fuels in domestic premises increased from 15 mill. tons coal equivalent to 32 mill. tons, or more than double the 1938 level.

Domestic fuel supply

In spite of a net increase of about 6% in 'coal equivalent' the tonnage of domestic fuel consumption over this period, was supplied from fuels other than coal and the proportion of total domestic fuel supply provided by coal dropped from 77% in 1938 to 53% in 1958.

The study of expenditure on household fuels carried out by the Social Survey in 1951-52 showed that while households where the principal earner had an income of over £10 per week spent nearly 25% more on fuel than those where the income was up to £3 per week, expenditure on solid fuel was only insignificantly higher. Virtually the whole of the difference was due to higher expenditure on electricity. The proportion of fuel expenditure spent on solid fuel dropped from 49% in the lowest income group to 41% in the highest.

The relative price of coal compared with that of other commodities has shown a steady upward trend over the past half-century, reaching 3½ times the 1880 level by 1959, while other fuel prices have shown a much more favourable trend. Since 60% of the cost of coal production is accounted for by labour, the relative price factor is an outcome of rising living standards, reflected in the upward trend of wages.

For the period up to 1920 there is little statistical evidence available on the changing trends of domestic fuel consumption. Nevertheless by 1923, gas was supplying 5½%, electricity 4% and direct use of oil 2½% of inland fuel supply.

With the coming of the electric light bulb, gas was, eventually, driven to search for new markets. The gas cooker—supplemented later by the wash-boiler and gas fire—was the answer. At this point gas began to displace coal in domestic use, and the cooking and laundry loads, in particular, were largely gained from coal.

The North Western Gas Board's market survey of 1956 showed that among working class consumers in houses built before 1920—nearly half the total customers in the area, and over 80% of customers in these older houses—gas was still almost unchallenged by electricity for cooking. For laundry also gas held the lead.

In comparison with the newer houses, gas was in a strong position for water heating—60% of working class customers in houses built before 1920 had no piped hot water system installed. The absence of the backboiler, which later became a standard feature in the great majority of houses in this area, had provided the opportunity for gas. About half of the customers in this social/housing group relied on gas for water heating. This compares with only about 3% on average, of customers in post-1920 houses using gas for this purpose.

Among the middle class in this housing group, nearly 30% used a gas fire, and this was the highest proportion in any social/housing group apart from the special case of inter-war local authority housing. Gas lighting was still used by 8% of customers among working class in pre-1920 houses.

The analysis of gas consumptions among prepayment customers (of whom over half were working class in pre-1920 houses) clearly showed the marked effect of the absence of a piped hot water supply. Prepayment customers with no piped hot water used typically about 10 therms more per quarter on the cooker and/or washboiler than those with piped hot water. Their average annual load was 113 therms, compared with just under 100 therms for all customers in post-1920 houses.

Between the wars

For the period between the two world wars there is little statistical information available on household fuel consumption. In total, however, in the inland fuel market as a whole, direct coal consumption fell by some 10 mill. tons, or about 8%, between 1923 and 1938. Gas sales increased by 29%, electricity sales were multiplied nearly five-fold, and the direct use of oil rose to 2¾ times the 1923 level. By 1938 the share of direct coal use in total energy supply had dropped from three-quarters to two-thirds, with gas accounting for 6½%, electricity 8½%, and direct use of oil 6¼% of total inland fuel; the advantage now, among the refined fuels, lay with electricity.

In the privately built houses, which constitute two-thirds of the inter-war houses among customers in the North Western area, there was a sharp fall in the share of solid fuel for cooking, which was approximately halved compared with pre-1920 houses. But the progress made was mainly in electric cooking, where the proportion of users

in working class houses (though still small) was doubled compared with the pre-1920 dwellings. The evidence here of the competition of electric cooking against gas in this period is likely to be understated because the survey was confined to gas customers and excluded 'all-electric' houses.

For laundry, gas continued to be strongly represented among the inter-war houses—particularly in local authority dwellings, where the policy of the councils in installing gas washboilers was a strong aid to sales. However, the electric washing machine now presented a serious challenge.

The most dramatic change, however, in the use of fuels in the inter-war as against pre-1920 houses occurred in respect of waterheating. Households with no piped hot water had virtually disappeared and the backboiler reigned supreme. At the same time and no doubt for this reason, the use of gas water-heaters, which formerly helped to fill the gap due to the absence of piped hot water, had been sharply reduced. To this extent the change represents a clear gain to coal. But this improved coal-based system was in turn challenged—at any rate for summer water-heating—by a 'refined' fuel offering labour saving and the elimination of unwanted room heating from the back-boiler fire during this season. Unfortunately, however, this fuel was not gas but electricity, used in the immersion heater.

Backboiler installations

The 1956 market survey showed that over a quarter of backboiler installations in the area were used in conjunction with an electric immersion heater compared with only 3% used in conjunction with gas.

The survey also showed that over three quarters of middle class, and half of the working class, customers in privately built inter-war houses were using electric space heaters; both representing appreciable increases over the proportions in pre-1920 houses. It is significant, however, that among the working class, gas space heater usage increased as well as that of electric heaters. Among the middle class there was a small reduction in gas space heater usage, together with a substantial rise in the use of electricity. In the local authority houses gas space heating (as well as laundry) received support from the policy of the councils in installing gas appliances.

In general, this second phase of the advance of refined fuels in the domestic market, during the inter-war period, represents a turning point in the fortunes of domestic gas; with gas displaced from its position as the leading refined domestic fuel by the rapid advance of electricity. Gas as well as electricity continued to advance at the expense of coal, although coal consumption recovered some ground through the widespread installation of the backboiler; this is likely to have been more than offset by the almost complete loss of the coal cooking load, together with a major displacement of coal for space heating in bedrooms and other subsidiary rooms, and a progressive loss of the summer waterheating load to electricity.

Since 1938 the pattern of change has been to some extent distorted first by coal 'rationing' and subsequently by de-control of coal supplies. So much so, that under the influence of these temporary factors it was, for a time, difficult to discern the continuation of the long-term trend. It is evident, however, that over the post-1938 period as a whole coal has again lost ground and the advance of the refined fuels has continued.

Between 1938 and 1958, while domestic coal consumption dropped by about a quarter, gas sales showed a net rise of about 40%, and domestic electricity sales rose to approximately five times the 1938 level. The use of oil in domestic premises, which has come into prominenc particularly in recent years, showed a three-fold increas While the share of coal in the total 'coal equivalent tonnage of domestic supply has dropped from 77% t 53%, that of gas rose from about 10% in 1938 to 12½% in 1958. Electricity increased its share of the marke from 6½% in 1938 to 24% in 1958 and oil raised its shar from only 1% in 1938 to 3¼% in 1958.

Clearly, therefore, in this latest phase of the advanc of the 'refined' fuels in the domestic market, it was agai electricity and not gas which showed the most rapid pro gress. Domestic coal supply, instead of falling gradually over the period as one might expect under free choic conditions, fell sharply between 1938 and 1948 and then remained approximately stable. It showed its competitive weakness not by a further fall but rather by failure to recover from this depressed level when freedom of choice was restored. When de-restriction came, coal consumption has shown no signs of rising beyond the level of about 25% below the 1938 tonnage, to which it was cut in 1948.

Gas consumption, also, has reflected the influence of coal rationing and later de-restriction. During the latter part of the war and in the immediate post-war years, total domestic sales and average sales per consumer were exceptionally inflated. Cookers and washboilers and other existing gas installations were used to supplement reduced supplies of coal for space heating and waterheating.

To some extent, the subsequent reduction in the level of domestic gas sales may be attributed to the emergence of more normal conditions after the period of coal shortage. Since about 1955, however, when coal availability has been much easier, there has been a further persistent downward trend which evidently reflects, to a large degree, the influence of market factors under comparatively 'free choice' conditions. It is important to note, however, that while electricity and oil have shown more favourable price trends than gas and have tended to gain the lead from gas in consequence, the price of coal has increased more than that of any other domestic fuel, including gas; and this has favoured gas as well as the other refined fuels, in competition with coal in the space heating market.

Post-war fuel usage

The analysis of fuel and appliance usage in the post-war houses in the North Western area survey reflected some of the outstanding features of the competitive trends in the post-war years. The proportion of electric cooker users among customers in post-war local authority houses showed a substantial rise. Since the survey was carried out there has evidently been a marked weakening in the gas cooker load in new housing. Returns, covering the first half of 1960-61, show that only two-thirds of new customers in new houses in the area had a gas cooker installed, compared with nearly 90% among all domestic customers at the time of the 1956 survey.

Even more serious is the tendency for gas to be excluded altogether from new houses. During the first half of 1960-61 gains of new customers in the North Western area were equal to only 60% of the number of new houses built. In local authority houses the proportion was 78% but in privately built houses it was only 49%. This latest proportion of only 60% of new houses fitted with gas compares with an estimated figure of about 83% among all existing dwellings in the North Western area. The annual rate of domestic customer losses in the North Western area has risen from about 30,000 in 1957-58 (when records were started) to about 46,000 in 1960-61, of which about half are classified as losses to electricity. It may be estimated that about 30,000 cooker users per annum are currently being lost among existing customers

The main cause is likely to be the replacement of old gas cookers by electric cookers, as well as the replacement of gas by electric cooking on the occasion of a change of tenancy.

In respect of waterheating, the survey showed little change in the post-war houses compared with those built between the wars. The use of gas waterheaters had been reduced even further below the inter-war housing figure, and the electric immersion heater maintained its dominant position as a supplement to the backboiler.

For space heating, also, electricity maintained its lead in the post-war houses. Local authority policy had changed since between the wars whereby gas fires were no longer being installed in council houses. The proportion of gas space heater users dropped from 32% in inter-war Local Authority houses to only 10% in the post-war houses.

Oil heaters were used at the time of the survey by 15% of customers in the North Western area (almost equal to the proportion of gas space heater users, at 17% for the sample as a whole). Since then, oil space heating has shown a major increase.

Continuation of trends

In its underlying causes the new phase which now presents itself is not really new at all. It is a continuation of the trends that have been outlined here, differing in degree rather than in kind from what went before.

Again, as previously, rising incomes will provide the main-spring of change. Between 1951, when the Social Survey enquiry into fuel expenditure was carried out, and 1958, personal incomes in this country increased by nearly 60%. Consequently with only a fractional increase in the proportion of income spent on fuel (from 3¼ to 3½%) consumers were able to afford a 75% rise in fuel expenditure in 1958. Average fuel expenditure per household rose from about £26 per annum in 1951 to about £42 per annum in 1958. At the same time, expenditure on 'radio, electrical and other durable goods' which include domestic fuel appliances increased by two-thirds from £14 per household in 1951 to £21 per household in 1958. It is clear that the time when expenditure per household in this country on fuel and durable goods of the kind indicated will reach £100 per annum cannot be far away. And this is a prospect which opens up an entirely new field for the fuel industries. It means, in effect, that in the first instance among the higher income groups, and later among households in this country generally, the way is open to the installation of a comprehensive central heating system.

And why should this next phase in the domestic fuel market favour gas, as against other refined fuels? What has happened so far in the space heating field may be described broadly as the 'bric-a-brac' stage, with bits and pieces of high grade fuel installations supplementing and partly replacing coal in various rooms within the house.

In this situation, gas for space heating was handicapped by two decisive disadvantages. First that gas room heaters are typically fixed installations, and, in the main, require a flue for effective operation. This gave the advantage to the flueless and easily transportable electric and oil heaters entailing little or no installation cost and ideally suited to a 'piecemeal' supplementary heat supply. In effect, that gas space heating was hardly able to enter the main living room, where the existing flue was occupied by the open coal fire and was, in the main, confined to bedrooms and subsidiary living rooms where it could hold its own insofar as a flue was available.

The second major handicap to the progress of gas for space heating in these circumstances was the relatively small consumption per customer to be obtained, while only supplementary heating was provided. The North Western survey of 1956 showed that occasional use of gas fires which was then the predominant use of gas for space heating, resulted in a consumption of only about 20 therms per annum. Under these conditions there was little chance for gas, with its large proportion of 'fixed' costs in domestic supply, to overcome its price handicap by increased consumption per consumer, and a consequent reduction in overhead costs per therm.

What is now at stake, however, is not a few therms here and there, scattered all over the house, but a comprehensive heating system that will replace not only the coal fire but also the unsatisfactory bric-a-brac of makeshift supplementary heating. The load is about 250 therms per annum on the basis of only replacing the heat at present provided by the 2¼ tons of coal, or about 500 therms for a complete whole-house heating and waterheating installation. At this scale of demand, at least trebling the current level of domestic gas consumption per consumer, the impact of overhead costs in domestic gas supply is drastically reduced and prices can be offered which fully restore the competitive position of gas against other high grade fuels—not only for space heating but also for other uses.

The domestic 'house heating' two-part tariff, which was introduced in the North Western area in the summer of 1959, reflects the cost advantage of gas in this new large scale space heating market. In the Manchester area, gas used on a radiant/convecor heater is now slightly cheaper than coal used in an old-fashioned grate. Gas central heating costs about £80 per annum, including capital, for a 30,000-B.t.u. per hour installation, providing background heating and hot water supply for an average sized semi-detached house, and about £120 per annum for a larger (44,000-B.t.u. per hour) installation supplying full central heating and hot water supply. In both cases gas is cheaper than oil. Apart from coke or anthracite, which do not offer the labour saving advantages of an 'on-tap' fuel, gas has become, under this new tariff, the cheapest form of central heating in the North Western area. And the cheapest of all whole-house heating installations (excluding under-floor electric heating which is confined to downstairs rooms only) is the gas-heated fanned air system providing selective room heating or whole house background heating (17,000-B.t.u. per hour) with an annual cost of about £50, including capital.

New phase of opportunity

There is no lack of indications from sales figures and market survey information that the new phase of opportunity for gas in the space heating field has in fact begun and is in full swing.

The ultimate prospects of central heating in Britain's homes, now that this new phase in the advance of the high grade fuels has begun, can hardly be doubted. In a survey carried out in 1959 among middle class households it was found that in response to an 'open' question with no mention of central heating, about 40% of the sample thought that central heating was the best form of house heating; while in response to a specific question on the merits of central heating more than half gave favourable replies.

In the North Western Gas Board survey of gas fire buyers, carried out a year later, nearly one fifth of the sample stated that they had considered installing central heating; which was more than double the proportion who had reached this stage in their thinking in the Odham's survey in connection with the magazine *Woman* in 1958.

If gas is to succeed in this present decisive phase of

the advance of high grade fuels in the domestic market, it must free itself—as well as its customers—from dependence on coal. The very same factors of rising personal incomes and living standards which are inducing householders to turn away from coal to labour-saving fuels are also—through their effect on the level of wages—bound to produce a continuing adverse relative price trend for coal, due to the much higher 'labour content' of its cost of production, compared with the alternative gas making raw materials—oil and natural gas.

The adverse trend of domestic gas prices compared with those of competing high grade fuels during the post-war years was very largely due to the fact that the cost of carbonising coals increased by about 75% between 1950 and 1959, while the cost of coals used by electricity power stations rose by less than 50%; and the price of oil showed little net change, and certainly no sustained upward trend over this period. The use of new coal gasification processes will enable the gas industry to use the lower grade cheaper coals of which the costs are likely to show a more favourable trend than those of carbonising coals. Although this will reduce the cost of coal gasification and may even result for a time in parity of costs between coal-based and oil-based gas, the fact will still remain that coal has a much larger labour element in its supply cost than oil, and that oil is consequently likely to continue to have the more favourable *trend* of prices in a society where living standards are rising. Sooner or later, therefore, it will probably be found economic to operate gasification processes on the basis of oil or oil products rather than coal.

Natural gas importation

The most critical issue at the moment is, however, not so much whether coal or oil is to be used in gasification processes but whether the industry is to be allowed to import natural gas.

Natural gas is being sold in the U.S.A. at the present time at an average realised price of about 5d. a therm including distribution and all overhead charges. The average price to domestic consumers is about 8d. a therm and average consumption per domestic consumer is about 1,000 therms per annum. When one compares this with the average realised price of 21d. per therm overall, and 25d. per therm for domestic gas customers in this country, and the average consumption per domestic consumer of about 100 therms per annum, one can see that this is an entirely different world. A world of cheap gas in which sales have risen more than seven-fold since 1935 and have trebled since the end of the war.

But it is a world, also, which could, without great difficulty, be created here in Britain, by the simple process of allowing natural gas to enter the country. Estimated costs published by the Council of Europe in 1958 showed that natural gas could be brought from the Sahara to London by tanker at a delivered cost (including all charges up to the point of delivery but not the cost of reforming to declared calorific value or converting customers' appliances) of 5d. per therm. Import of gas by pipeline, which is by far the cheaper method, involving much less labour in transport and no costs of conversion from gas to liquid and back again, would give a delivered cost of 3d. a therm in London.

At the moment Britain is the only major power in Western Europe which has neither significant natural gas supplies of its own, nor any plans for linking itself to the European grid. And the benefits from which the people of this country are thereby excluded comprise not only a radical improvement in comfort standards in the home but also the advantages of access to a cheap and efficient raw material, particularly in the chemical, textile and plastics industries, which will be enjoyed by Britain's competitors in Europe. Moreover, time is running short and unless Britain joins in this enterprise in its present early phase she may find that those who have started the project and shared in the difficulties of its initial stages, are not anxious for others to come in later in order to share in its benefits.

One appreciates of course that reluctance to join in this pipeline network is motivated mainly by the desire to protect the coal mining industry. But what is it after all that is being resisted? It is the introduction into this country of a fuel which is cheap precisely because it liberates mankind from the need to win coal from the mines in dirt and drudgery and danger.

All countries with a large coal industry have an obligation to the miners. But it is an obligation to the miners as men and as citizens.

DISCUSSION

Mr. J. Castle, N.W.G.B., Mersey Group, who opened the discussion, said domestic gas sales were declining in spite of the number of domestic consumers increasing. This was due to the interest in labour saving devices, which were more apparent in electrical appliances. The gas industry could hardly be said to have benefited from the big increase in the use of gas appliances since the war, since the cost of their installation was high compared to that for electrical and oil appliances, used for what Mr. Polanyi termed 'bric-a-brac.' The gas industry must therefore concentrate its energies on worthwhile heavyweight loads, such as cooking, full space heating and water heating.

The standard of living was largely dependent on the high level of employment of women in all walks of life, a large proportion of whom were married, and the rate was increasing by as much as 1% per annum. In households where both husband and wife were working, the demand for space heating would become more pronounced, because they would not put up indefinitely with coming home to a cold house or a house where they had to set about lighting a fire; of this load the gas industry should become the major supplier.

'We will have to think,' he went on, 'in terms other than traditional raw materials for gasmaking. The era of solid fuels is on its way out, both smokey and smokeless, and we should not be unduly inhibited by the past in deciding how to meet the new load. We supply solid smokeless fuels and will continue to do so for some time, but our main effort should be directed to selling gas. If the public wants non-toxic gas, gas with lower sulphur content, then the industry must strive to meet that demand. Gas made from non-traditional materials lends itself to this.

'Major advances usually started in the higher income groups. That need not necessarily be the case with gas central heating, which had been installed in multi-storey blocks of flats, thus providing an opportunity to introduce economic gas heating to the working class population. People talked, and there was no reason why flat tenants should not tell house tenants about the efficiency, comfort and economy of gas heating. The next step was to interest local authorities in the use of gas for ordinary houses.

The industry had a very slender monopoly under the Gas Act. It had first chance to supply fuel through a pipe, but if it refused to supply natural gas through a pipe, it might well face competition from others willing to supply it in tanks or in liquid form. This would be difficult to resist, and if private firms entered this field it

would be a long time before the gas industry could recover from any initial disadvantage.

Mr. J. Baxendale, N.E.G.B., Bradford, pointed out that if underfloor electricity heating was cheaper it could have far-reaching consequences, as in multi-storey flats each floor could be regarded as the equivalent of a ground floor.

Mr. Polanyi replied that it was true that the capital cost of installing underfloor electric heating was cheaper than a Halcyon installation, but the consumer did not get comparative service. Underfloor heating by electricity had been disappointing in service.

Mr. N. C. Sturrock, N.E.G.B., Harrogate, said he thought far more than 500 therms per annum per household was at stake so far as whole house central heating was concerned. The figure was probably nearer to 750 to 800 therms per annum. In his area in districts where they had been successful in putting in a number of small bore and warm air installations, there had been an increase in consumption of 25 to 30%, compared with last year, and even during the recent 'summery' weather they continued to hold an 8 to 10% increase. The future undoubtedly lay in building up the heating load, especially since architects and builders were turning to the industry for heating installations.

This paper was an inspiration to everyone in the gas industry except perhaps those engaged in selling solid fuels, said **Mr. R. A. W. Hollingdale,** Smokeless Fuels Officer, N.W.G.B., Manchester, but it was necessary to introduce a note of caution. The picture presented was long term in outlook. The industry must not lose sight of the necessity to hold on to the existing load, and that in the immediate future included solid smokeless fuels.

Referring to fanned warmed air installations, he pointed out that there was no room for complacency for equal advances were taking place in other fields, including solid fuel for small bore central heating.

Mr. Polanyi said he did envisage covering coke as well as gas in the domestic market in the paper, but it was impossible to do justice to both. He accepted there must be a period of 10 or 15 years in which solid fuels would loom large in the picture.

Mr. J. Grayston, N.W.G.B., North Cheshire Group, stressed the opportunities for gas in water heating. If there was an immersion heater using gas as the primary fuel the potentiality would be enormous.

Mr. R. L. Greaves, N.W.G.B., South Lancashire Group, said this point about immersion heaters should not too easily be conceded. The gas industry had some excellent water heating appliances, such as the Ascot 715, which did not require an expensive copper cylinder.

The Chairman, **Mr. W. Hodkinson,** Deputy Chairman, N.W.G.B., said he agreed entirely with all Mr. Polanyi said about the future of the industry in the domestic field. That future could be achieved on the basis of present costs.

Coal still had a great future in Great Britain.

The scientists of Great Britain had decided some years ago that coal had had its day and thousands of millions of pounds had been spent on solving the problem of atomic energy. If less than one half of that money had been spent on the pits and in finding ways of converting coal into a refined fuel, by now the country would be competing with those people fortunate enough to have natural gas in their own country.

'I believe we are going to have a new look in the coal industry and unless we join in with our competitors, electricity, we may miss the boat. Electricity has some problems to solve in terms of transmission, and they are looking seriously at the possibility of gasifying coal at the pit head, and, instead of transmitting electricity, with its energy loss of 10 or 20%, of transmitting gaseous energy to the point of demand and converting it into electricity. We should be looking at the same sort of thing.'

From a paper read to the Southern Section of the Coke Oven Managers' Association.

Developments in coke screening

By M. SINCLAIR GASKILL, M.I.GAS E., M.INST.F., A.M.C.T.,
TECHNICAL DIRECTOR,
WEST'S GAS IMPROVEMENT CO. LTD., MANCHESTER.

A VERY considerable amount of research has been devoted and a vast amount has been written on the effects of coke quality on its utilisation but it is suggested that comparatively little information was available until recently on the importance of size.

During recent years the importance of correct sizing of coke and consequently of efficient screening for various applications has been more fully realised and a number of papers have been published on this subject.

A very considerable number of different designs of equipment for screening or sizing coke or other materials have been developed, but I propose to limit my remarks to one type of comparatively recent introduction, namely the resonance screen, so this paper deals mainly with one type, *i.e.*, the West Flämrich screen, the design of which the author has had the closest association.

Resonance may briefly be defined as the condition existing when a mass vibrates at its natural frequency. It is possible to maintain a body of considerable inertia in vibration by means of a very small force provided that this force is applied at the correct regular intervals. A simple illustration of this principle is a pendulum in which a vibration of large amplitude may be set up by impulses of small magnitude. The setting up of the vibration or swing depends on the timing of the impulses. When these impulses have a frequency equal to the natural frequency of the suspended mass the resultant has been termed resonance.

While this is the basic principle of this design, in actual practice true resonance is, for practical reasons, not attained. This type of screen should be more accurately described as a 'pseudo-harmonic resonance screen.' Such a screen operates under conditions approaching true reasonance and among other advantages requires low

driving power as compared with a conventional vibrating screen.

Its basic components are two counter vibrating masses between which a condition of mutual pseudo-harmonic resonance is established. The screen can be considered as consisting of three main parts, namely the screen frame containing the screening surface, the balancing frame which is the counter vibrating mass, and the driving gear. The screen frame is freely supported on flexible laths mounted on the balancing frame.

The balancing frame is between three and five times the weight of the screening frame and as a result has an operational amplitude of between one-third and one-fifth of that of the screen frame. It is of a box construction suitably loaded to obtain the required balance ratio. This frame is supported on rubber base pillars with no other connection to the supporting structure and is therefore free to vibrate independently of such structure.

Eliminating vibration

The base pillars are arranged either singly or in groups of two or three, dependent on the size of the screen at four points near to the end of the balancing frame. By mounting the complete screen as a self-contained system on these resilient rubber pillars, vibration in the supporting structure is virtually eliminated.

The drive consists of an eccentric with a soft rubber buffer interposed between the connecting rod and the screen frame. This flexible connection permits the use of a comparatively small and simple dry assembly and by spreading the starting load over a number of revolutions further reduces the size of the motor necessary.

Combined with the fact of operating gear to the natural frequency this form of drive ensures smooth and regular starting and stopping of even the largest screens. Moreover the flexible connection permits the adjustment of the amplitude of the system over a wide range with a standard eccentric.

The connection from the motor to the driving gear is by means of a multiple 'V' rope drive. The motor may be mounted on the supporting structure independent of the screen or if desired on the balancing frame.

Two types of rubber buffers are mounted at intervals connecting the upper face of each side of the balancing frame to each side of the screen frame. These two types are termed 'middle batteries' and 'air-gap' or P.S.H. buffers.

The middle batteries are constructed of a series of rubber disks forming laminated cylinders and are assembled with pre-compression. These batteries work during the whole stroke of the screen, alternately storing and returning the kinetic energy of the screen frame. As a result of this arrangement, the power required when the screen is in operation is only that required to replace the frictional loss and the heat losses dissipated through the buffers, and for the actual transport of the material on the screening surface.

The P.S.H. buffers consist of special rubber pads with air gaps between the working faces. These only come into operation near the end of the stroke and alter the nature of the system from a simple harmonic to a pseudo-harmonic one.

If a screen is fitted with middle batteries only both displacement and acceleration would follow the laws of simple harmonic motion and can be represented by a sine curve.

The P.S.H. buffers give additional acceleration (positive and negative) as they come into operation at the ends of the stroke (90° and 270°).

A more intense screening effect is obtained when a degree of turbulence is maintained in the material being screened so that each particle will in due course come into contact with the screen surface and will under the right condition pass through the appropriate sized aperture. Stratification, which tends to occur on horizontal or near horizontal screens with straight line reciprocating motion, is thereby minimised. Moreover the amplitude of the vibration of the screen frame may be controlled and varied by the adjustment of the air gaps in the P.S.H. buffers. Thus the amplitude may be readily adjusted to the minimum intensity to meet screening requirements in order to obtain maximum life from the equipment. Conversely the operation of the screen can be intensified to meet adverse conditions, as for example with fine material having a high moisture content.

Screening intensity may be defined as maximum acceleration of the screening medium, and is usually expressed as a multiple of the earth's acceleration, g.

An approximate numerical statement of this is as follows:

$$\text{g factor} = \frac{\text{strokes (inches)} \times (\text{rev./min.})^2}{70{,}000}$$

Though on an empirical basis serving merely as a comparison of one set of conditions with another, it does show that intensity is proportional to the square of the speed and to the stroke or amplitude, the amplitude being half of the stroke. Additional acceleration applied at the end of the stroke causes the resonance screen to operate at a higher intensity, usually 4 to 5.5 g, than would be indicated by the above formula, which is based on the formula for simple harmonic motion. Normal vibrating screens operate at about 3.5 to 4 g although some modern designs work at up to 5 g.

Resonance screens are made in a wide range of sizes and can be adjusted to meet requirements. To obtain the best results it is obviously desirable before installing a screen to determine as far as practical the relative factors of conditions which will obtain and the results desired. These important factors are rate of transport and depth of material on the screen deck.

Resonance screens

With resonance screens the rate of transport is normally about 60 ft. per minute for a horizontal screen and 75 ft. per minute for a screen having a 5° slope.

For efficient screening it is desirable to maintain a minimum depth of material on the screen deck. As an approximate guide this depth should not exceed five times the size of the mesh opening at the feed end of the screen.

The following formula gives the various factors relative to depth of material:

$$1. \qquad D = \frac{T \times B}{5 \times W \times S}$$

As a guide to the area required for a given capacity, two formulae have been evolved as follows:

$$2. \qquad A = \frac{T \times B}{3.2 \times M}$$

While the above empirical formula is usually sufficient as a guide to screen size the following formula gives a somewhat more accurate figure:

$$3. \qquad A = \frac{T}{C \times M_1 \times K \times 0.01B}$$

Where

D = Depth of material in in.
T = Weight of material screened in tons per hour.
N = Width of screen in ft.

S = Speed of transport in ft. per hour.
B = Bulk density of material in cu.ft. per ton.
A = Area in sq.ft.
M = Size of mesh openings in mm.
C = Factor based on size of mesh openings.
M_1 = Factor based on percentage of over-size material in feed.
K = Factor based on percentage of half-size material in feed.

It is, of course, impossible to obtain the exact size of a screen by calculations, and that the foregoing formulae merely serve as a useful guide in determining the approximate size of a screen for any given requirements.

The main difficulties in screening which the various screen designs have been designed to solve are 'pegging' and 'blinding.' Pegging is caused by shaped pieces of coke, usually finger shaped, becoming fixed in the openings of the screen plate or mesh. Blinding results from moist fine materials accumulating in and round the openings.

Independent vibration

Blinding and to some extent pegging is reduced when the screen surface is of a type where the wires or rods are free to vibrate independently. A highly polished surface of a common resisting nature such as stainless steel is an advantage but this may involve considerable cost.

Two other methods of overcoming this problem have been used, namely the 'ball deck' and heated screens. The former consists of fitting a large mesh a short distance below the screening mesh. Rubber balls are placed between the two decks and the movement of the balls caused by the vibration of the screen hammers the screening deck from the under-side thus tending to prevent both pegging and blinding.

A heated screening mesh may be of advantage in preventing or reducing the blinding caused by the addition of moist fine material. Heating is not normally necessary with a resonance screen, but where it is desired to screen coke breeze with a high moisture content over, for example, a ½-in. mesh, heating may be an advantage.

No practical method of coke screening can be completely efficient and a certain proportion of undersize coke invariably passes over the screen.

Capacity and efficiency in a screening operation are closely related since the screening efficiency is affected by the rate of feed. The higher the rate of feed the lower the efficiency and vice versa. Other factors affecting the efficiency of a screen are the moisture content and size range of the coke as fed to the screen. If the moisture content is high the efficiency is lowered. Also, if the coke to be screened contains a relatively large amount of oversize or of a size close to the size of the mesh openings the efficiency will be adversely affected.

When screening material such as coke it is difficult to define efficiency since this depends on a number of different standpoints. A considerable number of methods of obtaining and stating screen efficiency have been proposed. From these the following four methods have been selected, but it should be noted that these four methods compared with each other will give widely varying efficiency figures.

Method 1.—The percentage of the undersize in the coke fed to the screen which is found in the coke passing through the screen. Expressed as a formula:

$$\text{Screen efficiency, \%} = \frac{100 \times \text{actual undersize}}{\text{true undersize}}$$

where true undersize is the undersize in the coke feed as determined by sieve analysis and actual undersize is that obtained from the screen.

Method 2.—The percentage of the oversize in the coke fed to the screen which is found in the coke passing over the screen.

$$\text{Screen efficiency, \%} = \frac{100 \times \text{true oversize}}{\text{actual oversize}}$$

True oversize

True oversize is taken as the oversize in the feed as determined by sieve analysis and actual oversize as the oversize as obtained on the screen.

Method 3.—The percentage of coke in the product from the screen which is above the size of the opening in the screen mesh when a single mesh is in use, or between the screen sizes when two meshes are in use.

Method 4.—The percentage of coke in the product from the screen which is above a specified size limit with a single screen or between specified limits with a double screen.

With this method the efficiency is not directly related to the actual size of the mesh. For example, if the specification called for coke between 2 in. and 1 in. the actual size of the screen openings would probably be 2¼ in. and 1¼ in. respectively.

With good effective screening of coke methods 1 and 2 will give efficiencies of up to 90%. Method 3 will easily show an efficiency of over 70%. With this method a low ratio of screen sizes will reduce the resulting efficiency. Under good conditions Method 4 will give efficiency figures of over 90%.

COAL TAR FUELS (Second Edition)

Edited by W. H. Huxtable. Foreword: Rt. Hon. Richard Wood, M.P., Minister of Power.

COAL tar fuels make an important contribution to the fuel resources of the country in these days of increased usage of liquid fuels. They are derived from British coals and have the advantage of a low sulphur content and high flame emissivity.

The authors of this new and wholly rewritten edition are experts in the field of liquid fuels, especially of coal tar fuels, and they have been closely associated with the development of these fuels in recent years.

There is a description of the production of coal tar in the coal carbonisation process, then general surveys of the technique of coal tar distillation to give the valuable products. It is also shown how the different coal tar fuels are prepared.

PUBLISHED BY THE ASSOCIATION OF TAR DISTILLERS, 9 HARLEY STREET, LONDON, W.I.

PRICE: ONE GUINEA.

Technical developments

DETACHABLE SELF-LOADING DUMPER

THE cost of moving material, whether it be coal, coke, earth, rock, sand etc., has always been an expensive necessity.

A method favoured today by many is the tractor drawn dumper, and a recent and important development in this field is the introduction by Mackay Industrial Equipment Ltd. of the Morewear Goose. Mackay, now the sole distributors, claim that the Goose, manufactured by R. Smith (Horley) Ltd., is the first British detachable, self-loading dumper. A demonstration, followed by a lunch, was given to the technical and trade Press at the Royal Festival Hall, London.

Basically the Goose consists of a ruggedly constructed tipping body carried on a two-wheeled 'H' frame chassis which is coupled to the power unit by a goose-neck extension.

One of the features of the design is the actual connection between the power unit and the tractor. This is a quick-release ball coupling which permits the dumper to be detached from the tractor in less than 90 seconds. This coupling gives the Goose considerable versatility, as one tractor can handle several dumper units, or be used for other duties. Full advantage of the quick release coupling is obtained when the tractor is fitted with hydraulic shovel equipment. This enables the dumper to become a completely self-contained loading, hauling and dumping unit, operated by only one man.

To take further advantage of the quick release feature, a telescopic hydraulic jack is built into the base of the goose-neck, which is completely retracted when not in use, and when the dumper is to be uncoupled the jack is quickly lowered to support the front of the dumper. When the detached dumper is being loaded, additional support can be given by lowering two loading stands which are bolted to the main frame.

The dumper body has been designed to hold 5 to 7 cu.yds. or 8 to 10 tons. Hydraulic power from the tractor operates the low pressure ram of the simple and rugged tipping gear. The ram operates in the centre of the lifting arm plates and converts the backward thrust into a true upward lift. This method ensures a smooth tip with complete absence of backward thrust on the hinge plates and hinge pivots. This compound leverage hoist works at a maximum pressure of 2,000 p.s.i. and gives a 60° tip of the body, ensuring complete ejection of the stickiest materials The control lever is situated adjacent to the driver's seat.

The power unit of the Goose, the new 50 h.p. Fordson Super Major, has a differential lock, a device by which the driver can cut out the differential action of the rear axle shafts, so obtaining the effect of the combined pulls of both wheels. This has been made possible by the development of a new and stronger differential assembly, the side gears of which can be locked together by a splined coupling.

The Smith Clam gate tail board is automatically operated each time the body is raised and lowered. This device is particularly suitable when light materials such as coke or coal are being carried or when there is the possibility of spillage when travelling on the roads. The Smith Clam gate can also be obtained with a water tight seal, an additional feature, for the carrying of slurry, water or concrete, and other semi-fluids.

The hydraulic shovel equipment attached to the power unit has a generous 1 cu.yd. capacity bucket which has a discharge height of approximately 10 ft. to the centre of the hinge pin.—*R. Smith (Horley) Ltd. Distributed by Mackay Industrial Equipment Ltd.*

Plant and process control

THE development of automatic process plant control equipment is being carried out in the Data Processing Research Laboratories of Elliott Brothers (London) Ltd. The project has been given the code name ARCH which stands for Automatic Register Controlled Hierarchy.

The ultimate aim is to bring advanced automation projects within the reach of small manufacturers and also to enable the introduction of automation into industry generally to be carried out step by step.

In this way manufacturers may be encouraged to try out inexpensively the effect of the application of computing techniques to their particular processes.

The intention is to produce and market a range of basic electronic devices which can be assembled into many different systems to control plant and processes of many different types.—*Elliott-Automation Ltd.*

Heat resistant belting

RECENTLY developed by The Goodyear Tyre & Rubber Co. (Great Britain) Ltd., Wolverhampton, is the Terylene reinforced Thermo-Flo heat resistant conveyor belting (Spec. 272 and 124) which is a premium grade hot materials conveyor with similar properties to cotton reinforced Thermo-Flo conveyor.

The belt is available with two types of carcass reinforcement: TD.90 will rate at 90 lb. per ply in. for vulcanised joints and 50 lb. per ply in. for mechanical fasteners. TD.112 will rate at 112 lb. per ply in. for vulcanised joints and 54 lb. per ply in. for mechanical fasteners.

The belt is available in widths and plies as required for the various conditions of service.

Thermo-Flo Terylene can be made endless by vulcanised joints either in the factory or on site by mobile field splicing service.—*Goodyear Tyre & Rubber Co. (Great Britain) Ltd.*

Fine silica cement

SILLITE has been used for many years in the British steel industry, with considerable success, as a jointing medium, but its introduction in the gas industry is an entirely new venture, which began 18 months ago with trials carried out by the North Western Gas Board. After many rigorous tests it was proved by the Board, and is now in full-scale usage.

Sillite is a finely-ground silica cement with high refractory properties, having a fusion point of over 1,720°C. It is particularly suitable as a jointing and patching medium, and for this purpose is being used extensively, for use with both alumina and silica bricks.

Due to its very fine grading Sillite gives the thinnest possible joint which is exceedingly durable and resistant to slag attack. With good even-shaped bricks, 'dipped' joints are highly successful.

The cement, in dry powder form, is supplied in 1 cwt. paper sacks. No further preparation is required apart from mixing with water to form a good plastic slurry. In order to obtain the best results, this should be done initially about 12 hours before use.—*J. Stoddard and Sons Ltd.*

Time-lag valves

DANFOSS have recently extended their range of solenoid valves to include two types with time-lag device.

The valves differ from Danfoss' corresponding sizes of standard solenoid valves type EVJ and type EVJD, only in

the design of the coil. For these new valves a built-in NTC resistance is connected in series with the coil winding.

The result is that the valve will not open until a certain time after the circuit has been closed, corresponding to the time it takes to heat the resistor so that its resistance has dropped sufficiently to enable the current to open the valve.

In thermostatically-controlled gas installations with hot spot ignition, it is possible to delay the supply of gas to such an extent that the filament is allowed to grow sufficiently hot to secure ignition, and the fairly common small explosions at the moment of ignition are thereby avoided.

The valves can be used wherever a brief delay of the admission of a liquid or a gas is required.—*Danfoss (London) Ltd.*

Pipe thread seal

RICHARD Klinger Ltd., are manufacturing a pipe thread seal consisting of an unsintered ribbon of P.T.F.E. The unsintered ribbon is wrapped around the pipe thread and, being readily distortable, it completely conforms to the contours of the thread, producing a perfect seal.

It is effective with pipe joints made of iron, stainless steel, copper, brass, aluminium, and plastic up to pressures of 10,000 p.s.i. and for such diverse material as water, acids, oils, solvents, steam and gases.

The ribbon is ½ in. wide and may be applied directly onto the pipe thread; it is also available in the form of string which is particularly suitable for heavy engineering applications.

This seal is of extremely low co-efficient of friction at .04; this means that pipes can be easily unscrewed after years of usage. The permissible temperature range is from −250°F. to +475°F., although it is advisable to avoid prolonged exposure to fumes at temperatures exceeding 400°F.—*Richard Klinger Ltd.*

Plastic small bore tubing

FLOLINE is a new plastic tubing specially made for small bore installations. This ½-in. diameter high temperature plastic tubing offers considerable advantages over conventional piping.

It is flexible and can be run without bends and elbows, so making a great saving on time and costs. No lagging is needed because of low heat emission, and because of extra smooth bore larger circuits are possible than with ½-in. copper pipe.

Floline is supplied in 250 ft. coils and is ideally suited to standard compression fittings as used with conventional copper tubing.

It is particularly suited to central heating installations in old houses as no structural alterations are required and the work of installation can be carried out quickly and easily.

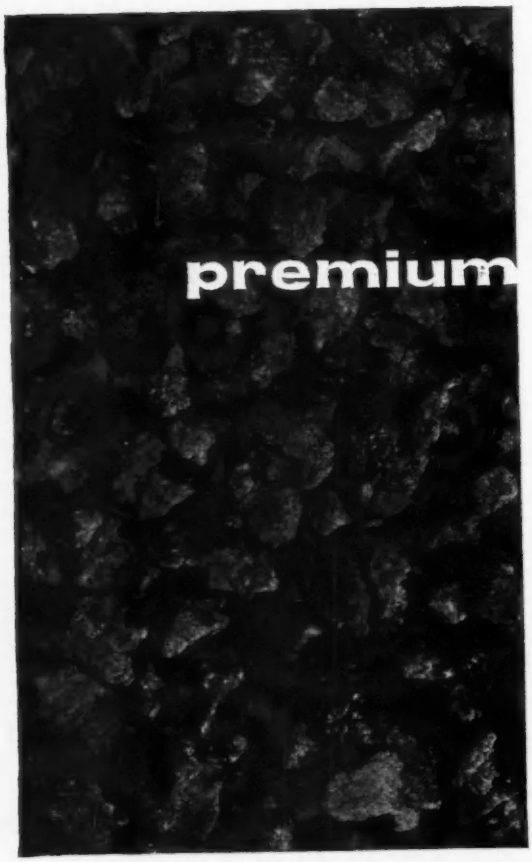
Heating engineers and builders are now recommending its use for central heating in new houses, especially where economy of installation is important.—*International Boilers & Radiators.*

Trade Publications

Four catalogues have been published which deal with the complete range of Keith Blackman Tornado standard blowers and exhausters. They are complete with specification, drive arrangements, capacity tables, dimension drawings, etc. They are publications Nos. 53, 7, 54, and 47. Publication No. 55 describes the Tornado hydro precipitator dust collector.—*Keith Blackman Ltd.*

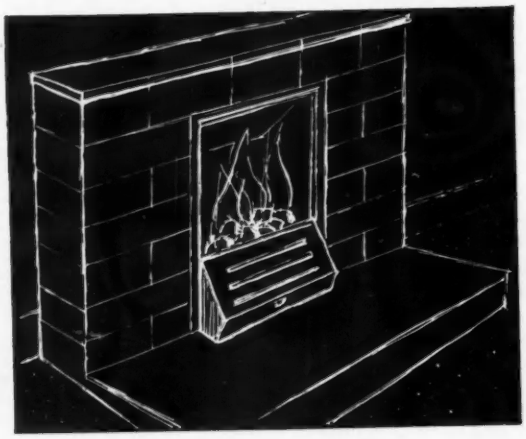
* * *

Head, Wrightson & Co. Ltd. have produced a leaflet covering a new range of low head cooling towers. These towers are specially designed for small industrial duties including air conditioning and refrigeration. Described here are the Head Wrightson-Fluor series 3 and 4 cooling towers; their construction and specification are described together with photographs.—*Head Wrightson Processes Ltd.*

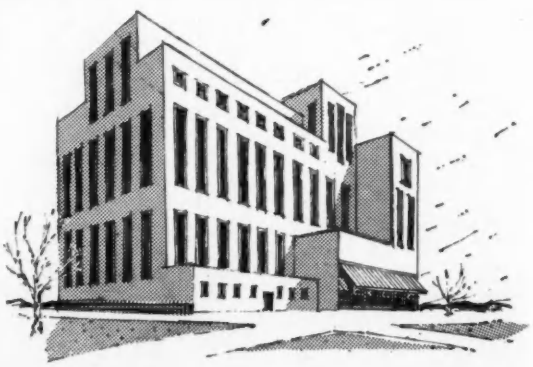


fuels

Glover-West Retorts produce a high proportion of the premium fuels in the new Smoke Control Areas. With its precise control of individual combustion chamber temperatures and rate of coal throughput, the Glover-West process lends itself particularly to the manufacture of a product of constant quality. Existing plants throughout the country are meeting the increased demand for these modern fuels which has followed the implementation of the Clean Air Act, while further modifications and improvements are constantly under review.



Glover-West CONTINUOUS VERTICAL RETORTS



WEST'S GAS IMPROVEMENT COMPANY LIMITED
MILES PLATTING MANCHESTER 10
Tel: COLlyhurst 2961 Grams: Stoker, Manchester.

London: Columbia House, Aldwych, WC2 Tel: HOL 4108
COL Div.: Chandos Ho., Buckingham Gate, SW1 Tel: ABB 6912
Midlands: 18-19 Ludgate Hill, Birmingham 3. Tel: CEN 1416.
Scotland: 183 W. George St, Glasgow C2. Tel: CEN 8351-2.

A MEMBER OF WEST'S GROUP OF INDUSTRIES

NEWS SUPPLEMENT

Italy finds new gas deposits

BIG new deposits of natural gas have been discovered in the Abruzzo region, east of Rome, and in Sicily.

The Abruzzo gas—found near Vasto, on the Adriatic coast—will be pumped to Rome.

The Sicilian find, in the Province of Enna, will suffice to meet all the requirements of Sicily.

One of the Enna wells during a test gave a daily output of 150,000 cu.m. of gas.

The announcement was made by Signor Mattei, President of Italy's State-controlled ENI-AGIP Oil Corporation, during a TV appearance, says the Rome correspondent of the *Financial Times*.

State boards face 5-year test on revenue

THE Government considers that the time has now come to clarify the financial responsibilities of the nationalised industries—including the gas industry—in order to establish a firmer foundation for future operations.

In a White Paper on 'The Financial and Economic Obligations of the Nationalised Industries' (Comnd. 1337, H.M. Stationery Office, 1s.), presented to Parliament by the Chancellor of the Exchequer last week, the Government considers that the following should be the financial objectives of the nationalised undertakings:

● **SURPLUSES** on Revenue Account should be at least sufficient to cover deficits over a five-year period.

● **IN ARRIVING** at the surpluses and deficits for each year there should be charged against revenue the items normally chargeable (including interest, and depreciation on the historic cost basis).

● **PROVISION** should also be made from revenue for—

(i) Such an amount as may be necessary to cover the excess of depreciation calculated on replacement cost basis over depreciation calculated on historic cost.

(ii) Adequate allocations to general reserves which will be available inter alia as a contribution towards their capital development and as a safeguard against premature obsolescence and similar contingencies.

● **THE GOVERNMENT** feels that more than five years would be too long a period for effectiveness and will agree with each nationalised industry which has financial autonomy under the Acts a framework on the above lines for the next five years as an experimental period.

● **THE OPERATION** will be reviewed each year in the light of events inside and outside the industry.

This Revenue Account project is the first of the three headings under which the Government feels that clarification or re-statement of the obligations and relationships envisaged in the nationalising Acts is needed.

The White Paper says that 'experience has shown a general need for nationalised industries—even those which were at one time reckoned to be relatively free from commercial risk—to build up adequate reserves to deal with contingencies which may affect their capital as well as their revenue accounts.'

It is felt that 'there are powerful grounds in the national interest for requiring these undertakings to make a substantial contribution towards the cost of their capital development out of their own earnings, and so reduce their claims upon the nation's savings and the burden on the Exchequer: this is particularly so for those undertakings which are expanding fast and which have relatively large capital needs.

'In normal circumstances, the desirable level of reserves should be related to the amount of capital employed in the business.

'It follows from all these considerations that the State, as owner or guarantor of the capital of the nationalised industries (which are investing over £800 mill. a year, more than half of which comes from the Exchequer), would expect capital employed in this kind of business to earn a higher rate of return than the cost of the money to the Exchequer.'

OBJECTIVES

The objective for each undertaking will be determined in the light of its own circumstances, needs and capabilities. For some, says the White Paper, the objectives may be expressed in terms of progress towards an appropriate level of self-financing of their capital expenditure, concurrently with the provision of suitable contributions to reserve.

'For others, the objective may be in

TABLE 1

Balances on Revenue Account and General Reserves

	Yearly results £ million						Unallocated Reserves and Revenue Balances Carried forward at the end of 1959	
	1954	1955	1956	1957	1958	1959	£ million	As a percentage of capital employed at the end of 1959
National Coal Board	− 3·5	−19·6	12·8	− 5·3	− 3·5	−24·0	− 52	—
Gas Council and Boards	1·9	0·8	3·8	2·8	− 1·5	− 2·4	25·5	4·4
Electricity Authorities and Boards (Eng. and Wales)	18·8	12·2	11·7	16·1	27·3	26·7	127·2	6·5
Electricity Board (South of Scotland)		0·6	1·2	0·5	0·27	0·1	2·6	1·9
Electricity Board (North of Scotland)	0·3	− 0·8	− 0·2	—	− 0·1	− 0·03	− 0·8	—
British Transport Commission	−11·9	−30·6	−54·4	−63·5	−89·0	−73·8	−350·6	—
British European Airways	1·06	0·61	0·06	1·08	0·23	1·7	2·28	4·4
British Overseas Airways Corporation	− 0·03	0·85	0·59	− 3·19	−11·36	− 0·29	−13·25	—
Post Office	Up to 1955-56 the Exchequer received any surplus		− 3·1	+ 2·6	+ 8·7	+20·9	27·2	3·1

terms of a specified rate of return on capital employed.'

The second heading covers Capital Account. Existing procedures for discussion and authorisation of investment and borrowing will be continued, and it will be the Government's task to be satisfied that the procedure within each organisation for scrutinising and approving capital expenditure is effective.

On the question of market borrowing the White Paper says: 'The reasons which caused the Government to discontinue in 1956 the procedure of borrowing from the market, with the support of a Government guarantee, and to withdraw the financing of the transport, gas and electricity industries from the market into the Exchequer are still valid.'

NO EARLY MOVE

While recognising the force of arguments in favour of requiring nationalised bodies to raise money from the market on their own credit, the Government sees no possibilities of an early move in this direction.

Whatever the future chances are, the White Paper says 'an improvement in the financial record, as contemplated under the present proposals, would be a prerequisite.'

Under the third heading—Prices and Costs—the White Paper says:

'A clear definition of each (nationalised) Board's financial obligations inevitably raises the question of the extent to which the Boards should have freedom in their pricing policies. Although the Government possesses no formal power to fix prices in the nationalised industries, undertakings have, in fixing their prices, given great weight to considerations of the national interest brought to their attention.'

It is stated, however, that 'increased prices would not be the only way in which nationalised undertakings could carry out the prescribed financial obligations.

PRODUCTIVITY

'For a variety of reasons, such as fructification of investment and reduction of unprofitable activities, combined with continuing improvements in commercial efficiency, some of the industries will be capable of increased productivity, part of which should be available to improve their financial results.

'The aim of the industries generally will naturally be to secure the necessary additions to their net revenue as far as possible by reductions in costs.

'The Government recognises, however, that the industries must have freedom to make upward price adjustments especially where their prices are artificially low.'

The White Paper says that while the case for greater freedom and flexibility in pricing policies is recognised, 'the Government must interest themselves in the prices of these goods and services which are basic to the life of the community and some of which contain a monopolistic element.'

It continues: 'In addition to the formal arrangements for the representation of consumers' views through Consultative Councils in the various industries and for the regulation of fares and charges in certain cases, the existing informal arrangements are that the Chairmen of the Boards ascertain in advance the views of the appropriate Ministers when they prepare to make substantial changes in the level of their prices.

'In the Government's view these arrangements should continue.

IN WRITING

'If a Board decided to modify their own proposals by reason of views expressed by the Minister it would be open to them to require a written statement of those views, which could be published by the Minister or the Board, and to propose an appropriate adjustment of their financial objectives where, in their opinion, this modification would significantly impair their ability to meet them.'

Financial performance, it is stated, is affected not only by the level of prices, but by the level of costs.

The White Paper adds: 'Costs may in turn be significantly affected by the amount of commercially unprofitable activities carried on by individual undertakings. These activities will, so far as practicable, have been taken into account in fixing the financial standard for each undertaking.

'To the extent that commercially unprofitable activities are subsequently imposed from outside, a Board would be entitled to ask for an adjustment of its financial objectives.'

The report concludes that the nationalised industries are from their size and nature bound to play a major role in the economic life of the country.

'They cannot, however, be regarded only as very large commercial concerns which may be judged mainly on their commercial results,' it says.

'All have, although in varying degrees, wider obligations than commercial concerns in the private sector. The object of these proposals is to find for each industry or Board a reasonable balance between these two concepts.

'The Government believes that the closer definition now proposed for the financial and economic obligations of the industries should help improve their performance and morale.'

What the Press has to say:

Comment on the White Paper has appeared widely in the Press. Some extracts follow:

Daily Telegraph: The Political Correspondent says.—'It will be surprising if Labour M.P.s . . . . see no objections to putting the nationalised industries into what some of them may regard as a financial strait-jacket.'

The Times: An editorial says.—'The financial record of the industries has so far been bad, and

TABLE II

Gross income (before depreciation) as a proportion of net assets (after depreciation)
Per cent.

	1954	1955	1956	1957	1958	1959
Manufacturing and distribution	20·8	20·9	20·0	19·3	18·3	19·0
Iron and Steel (55 Companies)	19·2	22·9	20·6	20·3	17·9	17·4
National Coal Board	10·3	7·7	14·1	10·9	9·8	8·3
Gas Council and Boards	8·2	8·4	8·7	8·8	7·8	7·8
Electricity (B.E.A., C.E.A., E.C., and Board)	10·7	9·9	9·3	9·6	10·6	10·7
South of Scotland Electricity Board		10·0	11·4	10·1	9·2	9·5
North of Scotland Hydro-Electric and Board	4·9	3·4	4·8	4·9	5·1	5·4
British Transport Commission	5·1	4·1	2·7	2·4	1·0	2·3
British European Airways	16·8	17·5	14·7	17·4	13·3	16·7
British Overseas Airways Corporation	12·1	13·2	11·9	6·7	6·4	12·7
Post Office	10·8	10·0	11·6	12·2	12·6	13·2

TABLE III

Net income (after depreciation) as a proportion of net assets (after depreciation)
Per cent.

	1954	1955	1956	1957	1958	1959
Manufacturing and distribution	17·5	17·4	16·3	15·5	14·3	14·9
Iron and Steel (55 companies)	15·3	19·0	16·8	16·4	14·1	13·3
National Coal Board	3·1	0·4	6·8	3·6	2·8	1·6
Gas Council and Boards	3·9	4·0	4·4	4·5	3·4	3·3
Electricity (B.E.A., C.E.A., E.C., and Boards)	5·6	5·1	4·7	5·0	5·7	5·6
South of Scotland Electricity Board		4·6	5·7	4·4	4·2	4·4
North of Scotland Hydro-Electric Board	3·3	1·8	3·2	3·3	3·5	3·9
British Transport Commission	2·8	1·9	0·2	−0·6	−2·1	−1·3
British European Airways	9·3	7·0	4·1	7·8	4·7	8·6
British Overseas Airways Corporation	3·8	4·2	3·4	−0·2	−0·7	3·9
Post Office	5·1	4·4	6·9	7·5	8·0	8·6

many of their investment decisions and price policies unsound. The White Paper sets out new financial objectives—which are based on the principles in the original nationalising statutes but take account of subsequent experience—which should have a salutary effect both on the industries and on the Government's attitudes in interfering with them.'

The Financial Times comments: 'In one important respect the Government's latest proposals will enable nationalised industries to operate on more nearly commercial lines. This is in fixing prices. The innovation here is that a Board that has been "persuaded" by a Minister to modify its own price proposals will have the power to obtain from the Minister a written statement of his reasons, together with an appropriate adjustment of the industry's financial target. This is a very powerful sanction, perhaps the most important proposal in the White Paper, and Board chairmen would be well advised to use it ruthlessly.'

The Guardian asks: 'What do "upward price adjustments" mean? It seems all too probable that this part of the White Paper is a softening up process towards price increases wherever nationalised trade can stand rack-renting—season tickets and express fares on the railways, electricity supply, telephone services, perhaps.'

The Daily Herald: 'The Government seems determined to make coal, railways and the rest become less of a burden on the Treasury even if this means dearer goods and worsened services to the consumer. . . . The Government is a little late in seeing the need to give the nationalised industries the chance to make a decent financial showing. The trade unions representing workers in these industries saw the danger long ago.'

ANOTHER WHITE PAPER

Another White Paper on Government Expenditure Below the Line' (Cmnd. 1338, 1s. 6d.) shows that spending—mainly in the form of loans to nationalised industries and other public bodies, is expected to rise by £34 mill. to £575 mill. in 1961-62.

Despite the rise in the total capital requirements of nationalised industries, their net borrowing from the Exchequer is expected to fall from £416 mill., in 1960-61 to £385 mill. in 1961-62.

THE BUDGET: Lloyd hits oil; boost for coal?

BUDGET points made by the Chancellor of the Exchequer, Mr. Selwyn Lloyd, which have particular interest for the gas industry, are headed by the reinstated duty on heavy oils—fuel and gas oils and kerosene—withdrawn in 1947.

The reinstatement is at the rate of 1d. a gal. Oils at present chargeable at 1d. a gal. will in future pay 3d. a gal.

It is estimated that this will add between £8-£10 to the central heating costs of a 3-4 bedroomed house.

The Industrial Editor of the *Financial Times* sees cause for gratitude by the National Coal Board in this tax to produce £50 mill., which he terms 'the first step which the Government has so far taken towards the "fuel policy" which the miners' union and (more discreetly) the Coal Board, have been advocating.'

PRICE RELATION

He says: 'An increase of 2d. a gallon in fuel oil prices is equivalent to £2 a ton. Since one ton of fuel oil is equivalent to about 1.7 tons of coal, this should swing the price relation in coal's favour by nearly £1 a ton, or some 15 per cent. on average.'

He sees the battle between coal and oil being concentrated in two markets where coal has up to now enjoyed a monopoly—gas and steel plant furnaces.

'The steel industry, infuriated by last year's rise in coal prices, is now experimenting hard with methods of oil injection into blast furnaces,' he says.

'To counter this the Coal Board is now planning an experimental plant to produce milled coal for blast furnaces.

'The Gas Council has for some time been planning to import oil and natural gas from the Sahara as an alternative raw material to coal.

ALTERNATIVE PLANS

'Again, the Coal Board is countering with alternative plans. In this case it is not only helping with projects for Lurgi coal gasification plants, but also wants to help the Gas Council develop a national gas grid running from the Midland coalfields down M.1 to London, to enable gas to compete better with oil and electricity.

'In both these markets, therefore, coal is fighting hard to fend off oil competition.

'In electricity, its biggest market, oil competition is effectively restricted by Government policy, though the power stations would like to use more oil if they were allowed to.'

The Chancellor said he had come to the conclusion that while not dispensing with any of the monetary methods, further means of stimulating or restricting the economy were needed, by measures which could be brought into operation quickly at any time of the year, and the effect of which would be reasonably rapid and widespread.

Mr. Lloyd said he had two proposals to make, both of which would be simple and would this year require no new administrative machinery.

'First, I propose that the Government should be empowered to direct by statutory instrument, at any time of the year, that either a special surcharge or a special rebate should be applied to all the main Customs and Excise revenue duties and to Purchase Tax.

'The total yield at present from these duties is over £2,000 mill. on an expenditure of about £7,500 mill. largely by private consumers.

A PERCENTAGE

'The proposed special adjustment will be expressed as a percentage to be added to or subtracted from the amounts otherwise payable—a simple arithmetical calculation of the same percentage, from the same date, for all charges under all the heads of revenue affected.

'The maximum change in either direction for which I seek authority will be 10% of the existing charges. As I say, that will be the maximum. It will of course be possible to make smaller changes such as 2½% or 5%.

'The effect of this proposal will be that I shall be able to stimulate or restrain consumers' purchasing power by a maximum of over £200 mill. a year each way, giving a range for this new instrument of over £400 mill. in all.'

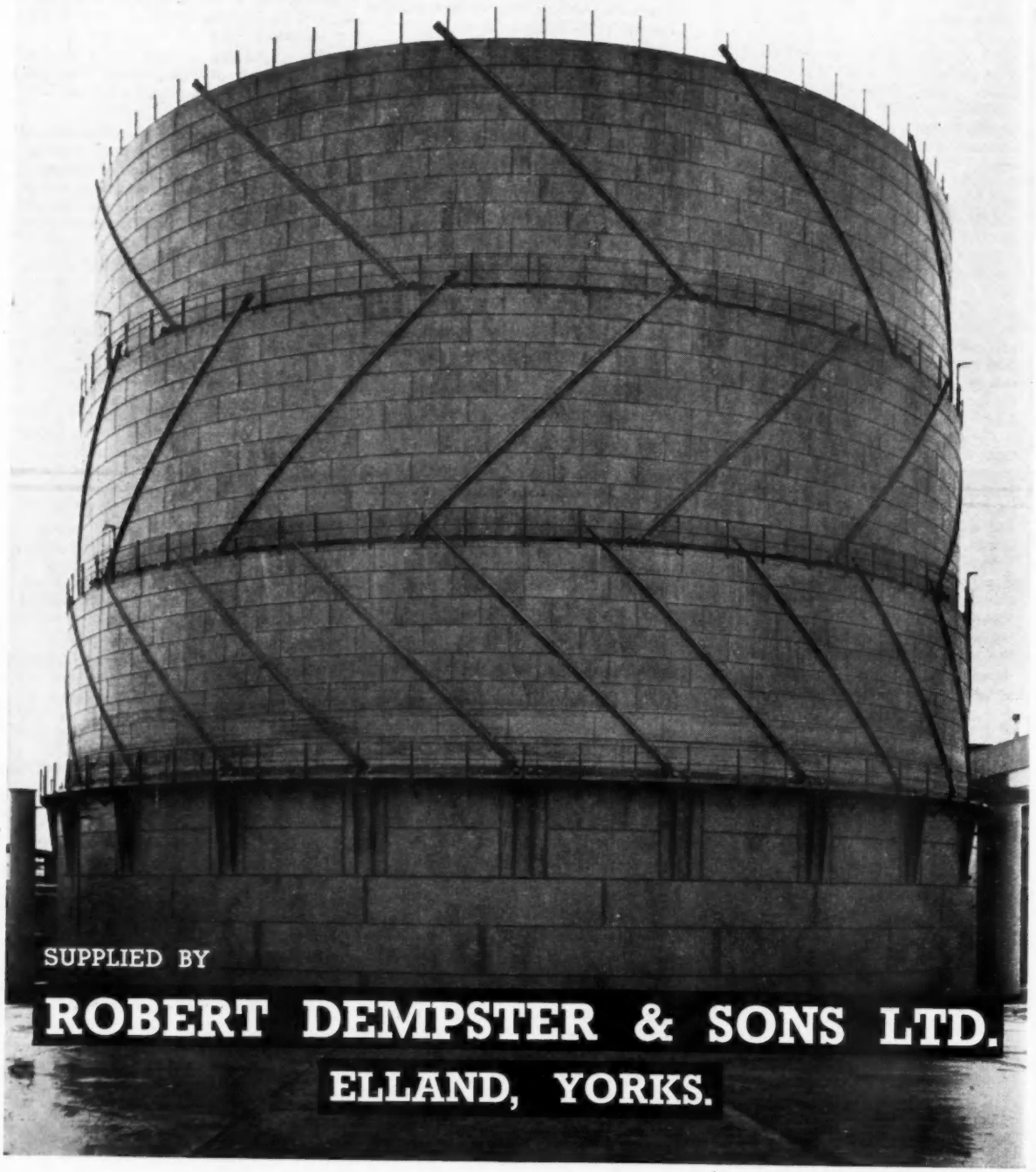
PAYROLL TAX

The Chancellor said: 'My second proposal relates to a special surcharge on employers analogous to a payroll tax. The use of such a measure as an economic regulator would have the added advantage that when we are faced with a situation of chronic shortage of labour, it would act as an incentive to economy in the use of man-power and to investment in labour-saving equipment.

'I propose to ask for power this year as a temporary expedient to collect this surcharge, should it be needed, by attaching it to the employers' share of the National Insurance Stamp.'

ST. ALBANS EXTENSIONS

1 MILL. CU. FT. CAPACITY
SPIRALLY GUIDED GASHOLDER



SUPPLIED BY

ROBERT DEMPSTER & SONS LTD.

ELLAND, YORKS.

Public schoolboys learn what gas offers career seekers

WITH the rapid changes now coming about in the gas industry—the development of new manufacturing methods and the introduction of new sources of supply—there must be capable and intelligent direction for them to be of maximum benefit to the country. The industry, therefore, needs to recruit the best possible brains for positions in management and in engineering.

To show public schoolboys the opportunities for careers in the gas industry, the Gas Council, in collaboration with the Public Schools Appointments Bureau, organises annually short works courses, the fifth of which has just been held.

It was arranged in co-operation with four of the Area Gas Boards—the East Midlands, South Western, Wales and West Midlands—and gave a brief insight into the range of activities within the industry.

25 participants

About 25 boys took part in the course, which included visits to the Litchurch (Derby) works of the East Midlands Gas Board, the heat treatment centre of the West Midlands Gas Board, the Gas Council's Research Station at Solihull, the oil plant at the Gloucester works of the South Western Gas Board and the Board's electronic accounting installation at Bath, and the Aberavon works and Swansea showrooms of the Wales Gas Board.

Sales changes for Bray's

SALES territories have been reorganised by Geo. Bray and Co., Ltd., of Leeds. The Sales Division, headed by Mr. John W. Tidswell, General Sales Manager, is divided into three groups: Technical Sales under Mr. Arthur Coates, Commercial Sales under Mr. E. Cawood.

Mr. D. Gowans controls the new U.K. Sales Territories and Representatives, which are: London, Mr. W. H. Scott; Southern Counties, Mr. A. Morton; South Western Counties, Mr. G. Brown; Eastern Counties, Mr. G. A. Atkinson; Wales and the West, Mr. S. Bradbury; Yorks. and Lancs. and Ireland, Mr. G. N. Milner; and Scotland and Northern Counties, Mr. T. Fraser, who has recently joined the Company.

Mr. G. Englehardt has been representing the Company in Western Germany for two years, and his present sales effort is being reinforced by the appointment of Mr. R. Wischet, who will cover the southern part of Western Germany, part of Eastern Germany and Austria, while Mr. Englehardt then takes over the northern part of Western Germany and the remainder of Eastern Germany. Mr. T. P. Schofield, now in London, will represent Bray in South Western Europe.

RAMSEY SHOWS 3% SALES DROP IN 1960

IN his review of the year at the annual meeting of shareholders of the Ramsey Gas Light Company, Ltd., Isle of Man, Mr. J. L. R. Brooke stated that the sales of gas in 1960 showed a decrease of approximately 3% on those of 1959.

They had no difficulty in disposing of all coke manufactured, the demand being mostly for small size. This resulted in more breeze being produced, which had to be sold at a lower price than coke. The overall effect was a reduction in revenue.

Tar oil sales drop

Tar sales were maintained at last year's level, but tar oil, for which there was some difficulty in finding a market, showed a drop in sales of some 2,000 gal.

Sales of appliances were pleasing, he added, and these, together with Calor gas, at £7,500 showed an increase of £1,300.

Conditions on the manufacturing side could only be described as difficult. There were increases in the price of freight, coal and all manufacturing materials, and wages again had an upward trend.

Plant replacement

'With the intense competition and high operating costs,' said Mr. Brooke, 'it is more than ever the directors' concern to make adequate provisions for the future replacement of machinery and plant. We, therefore, deemed it advisable to transfer from profit and loss income the sum of £200 to special purposes fund and £210 to renewals fund.'

Bad debts had been written off and there was a small credit balance at the bank against last year's debit of £3,129. The directors recommended a dividend of 7½%, or 30s. a share. This was approved.

McMullans Kosangas Ltd., has changed its address to 1 and 2, Upper O'Connell Street, Dublin. The telephone numbers remain unaltered.

FRENCH GAS IS BACK TO NORMAL DEVELOPMENT

PROVISIONAL French gas statistics for 1960 are now issued. After the temporary setback in rate of growth in 1959, the normal annual increase is now resumed.

'From one year to another the annual increase of sales of gas in France may be put at 8.9%.' The strengthening of French economy noted towards the end of 1959 produced its effects throughout the year over the principal sectors of industry.

Deliveries of gas to industrial establishments in 1960 exceeded those of 1959 by about 11.2%. The overall sales of natural gas by the affiliated companies, the Ste. Nationale des Gaz du Sud-Ouest and the Cie. Française du Méthane, together with that by Gaz de France itself, exceeded by 51% the corresponding figure of 1959.

Sales of gas to domestic consumers increased by 8.9%, but in the commercial field the increase, which has been slowing down since 1956, was only 7.4%.

The total sale of gas in 1960 was 17,140 mill. thermies (about 685 mill. therms), of which 6,760 (about 270 mill. therms) was sold in the Paris region.

Work starts on Suffolk nuclear plant

WORK has started on the £55 mill. nuclear power station at Sizewell, Suffolk. The station, which is being built by the English Electric, Babcock and Wilcox and Taylor Woodrow atomic power group, will be the largest nuclear power station at present under construction in the world, says the Scientific Editor of the *Financial Times*.

It will have an output of 650 megawatts, 580 megawatts of which will be fed into the 275-kilowatt supergrid. The station, which will be the seventh civil nuclear power station to be built in the U.K., will bring Britain's nuclear power station electricity output to 3,000 megawatts—over 10% of the country's generating capacity.

It will have two gas-cooled graphite moderated natural uranium-fuelled reactor furnaces.

The station will come into operation in 1966.

Gas lamps sell well

MORE than 30 street gas lamps auctioned by Sheringham Urban Council, Norfolk, realised over £200.

The lamps fetched from £3 10s. to £9 5s. each, and matching ornamental pairs sold for £15 10s.

MR. W. S. HUBBARD, production engineer of the North Western Gas Board's Mersey Group, has retired because of ill health, after 45 years' service with the gas industry. Mr. Hubbard began his professional career with R. & J. Dempster Ltd. in which he graduated to the drawing office and design staff before leaving in 1928 to join the Stockport Gas Undertaking as chief engineering assistant. In 1932 he moved to Leeds where he was responsible for works management at both the New Wortley and Meadow Lane gasworks. Nine years later he was appointed works manager of the Garston works in Liverpool. In 1943, under the general managership of MR. H. LEACH, he became gas engineer to the Liverpool Gas Company. On nationalisation he was appointed group production engineer of the Liverpool Group and continued in this position after its enlargement as the Mersey Group to include the Wirral Group in 1959. Mr. Hubbard is a past chairman of the Manchester District Section of the Institution of Gas Engineers and served four years on the Council of the Institution of Gas Engineers, being also a member of the Board of Examiners, and subsequently its chairman.

COMING EVENTS

April 26.—I.G.E., EASTERN SECTION: Visit to Cambridge Gasworks, Grid Control Centre and new M/S Gasification Plant in morning. In afternoon paper on 'Some Aspects of the Accounting Function in the Gas Industry,' by H. R. Hazeldine.

April 26.—THE NATIONAL BENZOLE AND ALLIED PRODUCTS ASSOCIATION: Granville House, 132-135, Sloane Street, London, S.W.1. Annual General Meeting. 2.30 p.m.

April 26.—YORKSHIRE JUNIORS: President's Day. Visit to W. C. Holmes & Co. Ltd., Turnbridge, Huddersfield.

April 26. — MANCHESTER DISTRICT JUNIORS: Visit to Derbyshire Silica Firebrick Company, Friden, near Buxton. 12 noon.

April 26.—SCOTTISH G.C.C.: Conference Room, Edinburgh and South Eastern Division, The Scottish Gas Board, 25, Waterloo Place, Edinburgh. 11.30 a.m.

April 27.—I.G.E., NORTH OF ENGLAND SECTION: Three Tuns Hotel, New Elvet. Joint Meeting with the Coke Oven Managers' Association. 'The Production, Treatment and Disposal of Effluent Liquors,' by E. T. Pickering. 7 p.m.

April 28. — LONDON AND SOUTHERN JUNIORS: 'Big Inch Steel High Pressure Pipelining Against Odds,' by J. E. Gray and J. W. Yates.

PERSONAL NOTES

MR. C. MARLEY, Director of Glover & Main, Ltd., who has completed 54 years' service with the Company, presented awards to employees who have completed 25 years' service. The employees are now to be members of the new '25 Club' which will meet annually in the future. To mark the inauguration of the '25 Club' Mr. Marley was presented with his badge by MR. H. J. BROOKER who has just completed his 25 years' service. Presentations were made to 120 men and women at Falkirk and to 133 at Edmonton. Those employees who have completed 40 years' service will be presented with an inscribed gold watch at the annual dinner of the '25 Club'.

Mr. C. Marley (right) presents Mr. H. J. Brooker with his long service award.

MR. D. BATES has been appointed Heating and Ventilating Engineer at the Head Office of the Southern Gas Board. His duties will include contact work with local authorities, architects, heating engineers and builders concerning major housing developments. He will also be available for design assistance on important individual schemes and will have general responsibility for ensuring that the Board's effort in the central heating field is applied as effectively as possible. Mr. Bates has been senior assistant engineer in the Chief Engineer's Department of the London County Council since 1947 and is an Associate Member of the Institute of Heating and Ventilating Engineers.

MR. R. A. BRADFIELD, who left England in 1954 to take up an appointment with the Brisbane Gas Co. Ltd. in Australia, has now been appointed Sales Manager Industrial and Commercial to that Company. Mr. Bradfield has also been made Chairman of the Industrial and Commercial Gas Committee of the National Gas Association of Australia.

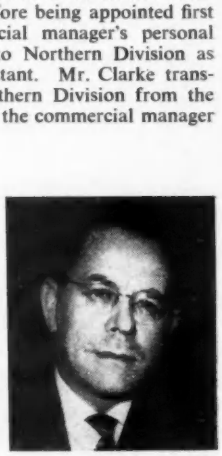
MR. W. MENNIE, works superintendent at Grangetown gasworks for the last 30 years, has retired. Mr. Mennie, who came to Cardiff from the Montrose and Birkenhead undertakings, was notably successful during the last war in maintaining gas supplies to Cardiff when three of the gasholders were put out of commission by enemy action.

MR. C. S. DAVIES, who became manager of Chesterfield gas undertaking in 1939 and was appointed district manager at Chesterfield for the East Midlands Gas Board on nationalisation, has retired.

NEW POST

MR. R. P. RHODES has been appointed to the new post of Chief Service Manager of the North Thames Gas Board. To succeed him as Divisional Manager, Eastern Division, is MR. J. L. SMITH who is transferred from the Board's Northern Division where for the past four years he has been commercial assistant to the divisional manager there. To replace Mr. Smith on the Northern Division, MR. F. F. G. CLARKE has been appointed Commercial Assistant there. Mr. Rhodes has been associated with the sales and service side for the whole of his career, mostly in the Eastern Division. In 1955, he was appointed commercial assistant, and in 1958 was appointed to the post of divisional manager. Mr. Smith was divisional accountant to the Board's Central Division before being appointed first to the commercial manager's personal staff and then to Northern Division as commercial assistant. Mr. Clarke transfers to the Northern Division from the personal staff of the commercial manager at Kensington.

Mr. R. P. Rhodes



Mr. J. L. Smith